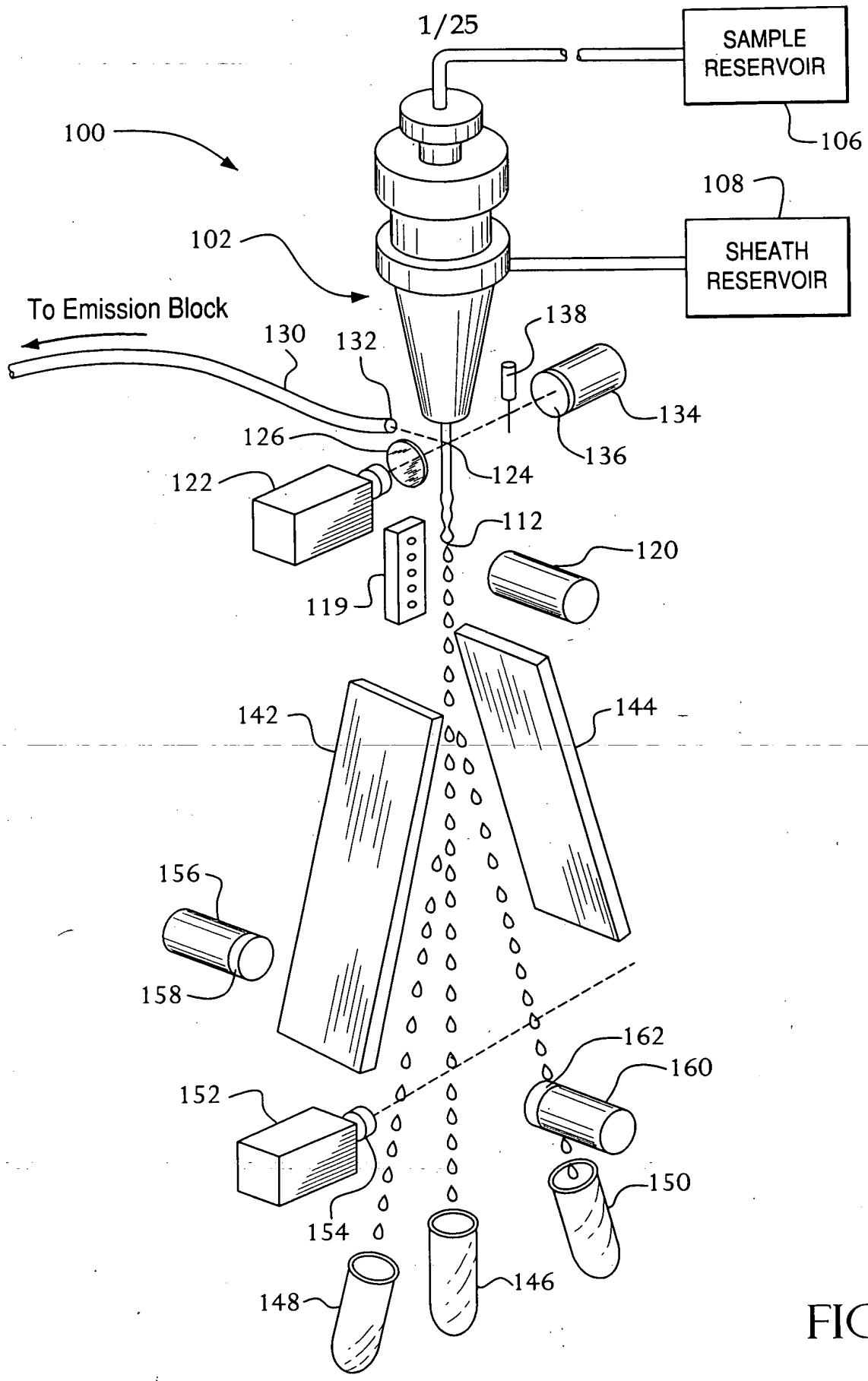
SAMPLE RESERVOIR
106
100
108
102
SHEATH RESERVOIR
To Emission Block
130
132
138
134
126
136
124
122
112
120
119
142
144
156
158
162
160
152
150
154
148
146

FIG. 1

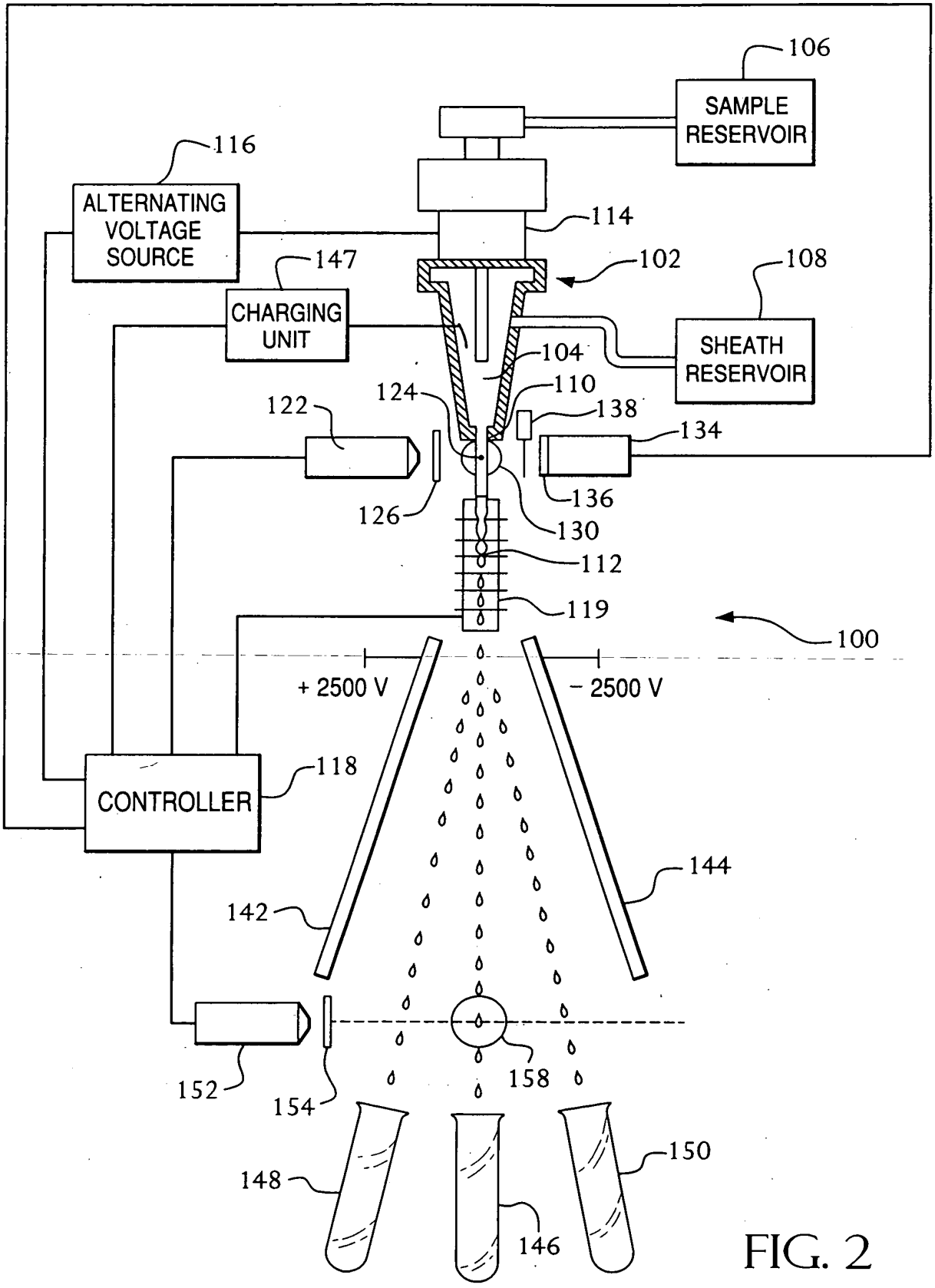
106
SAMPLE RESERVOIR
116
ALTERNATING VOLTAGE SOURCE
114
147
102
108
CHARGING UNIT
SHEATH RESERVOIR
104
110
124
122
138
134
126
136
130
112
119
100
+ 2500 V
− 2500 V
118
CONTROLLER
144
142
152
154
158
148
150
146

FIG. 2

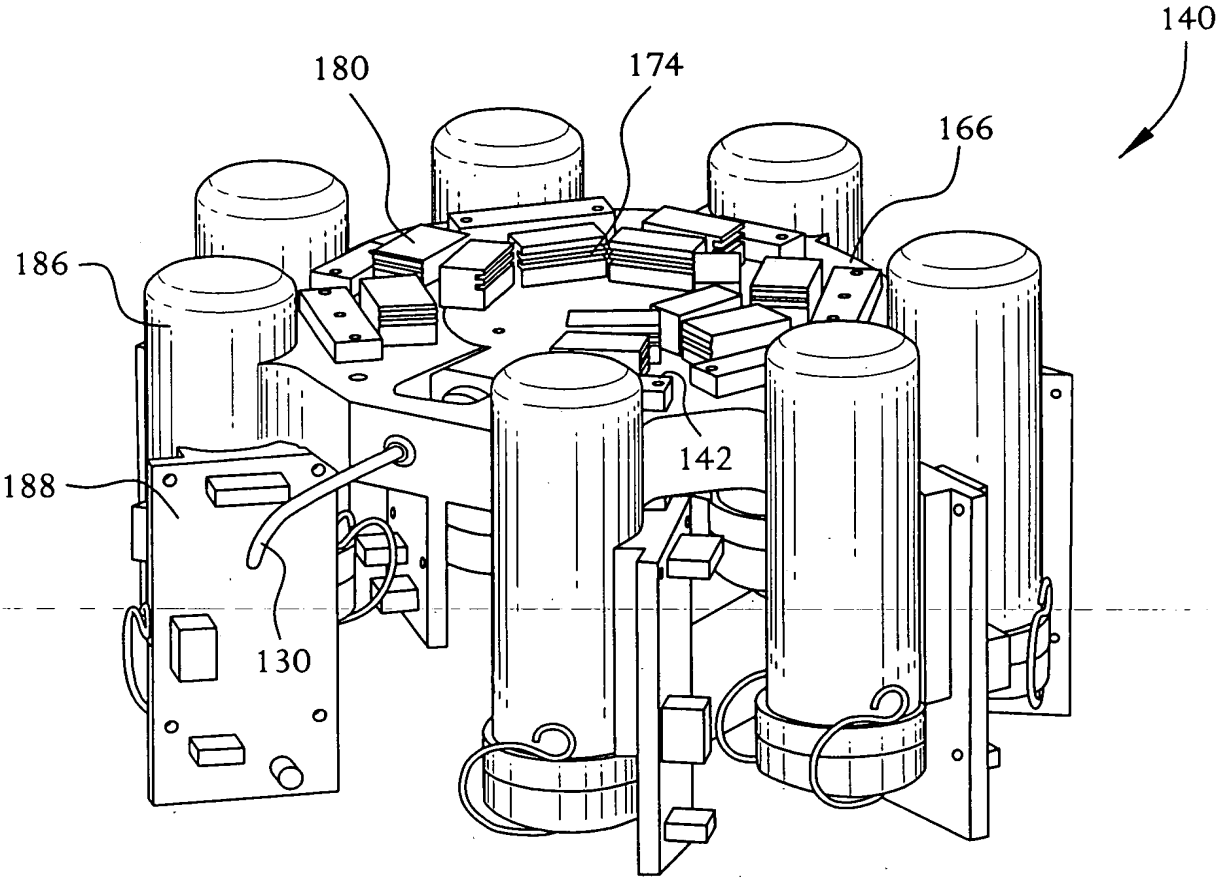

FIG. 3

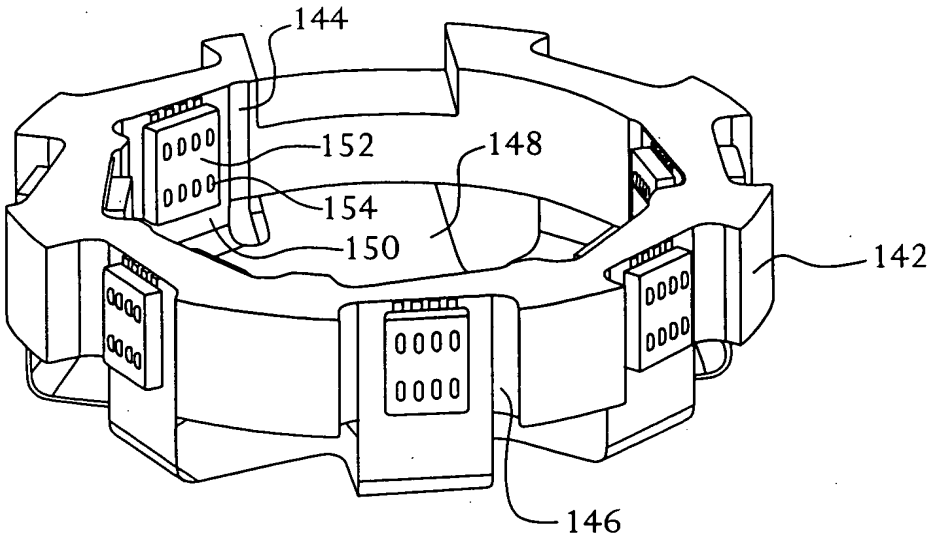

FIG. 4

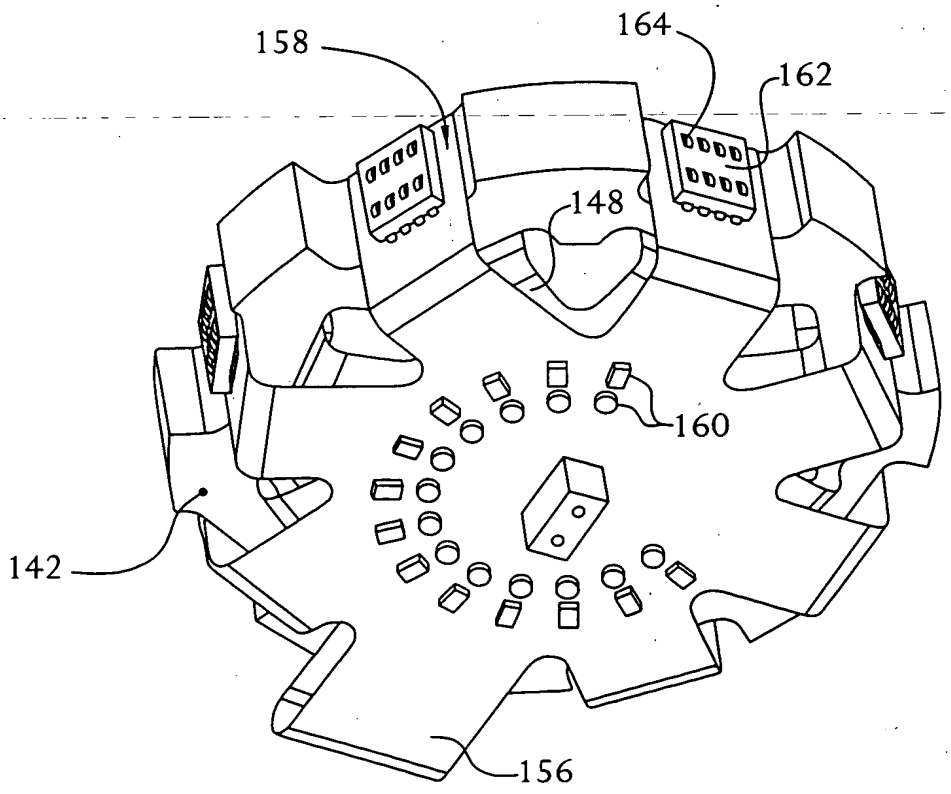

FIG. 5

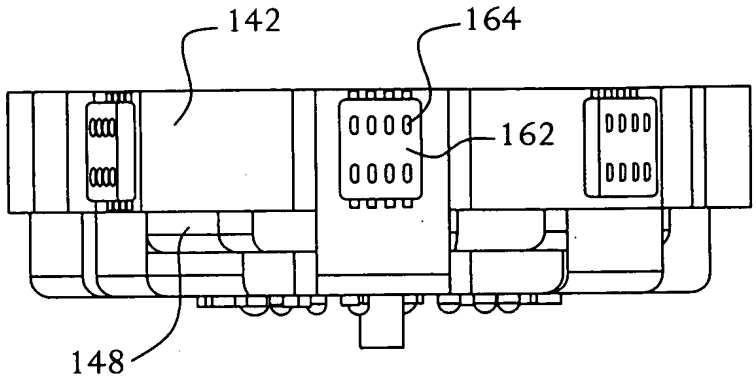
142
164
162
148

FIG. 6

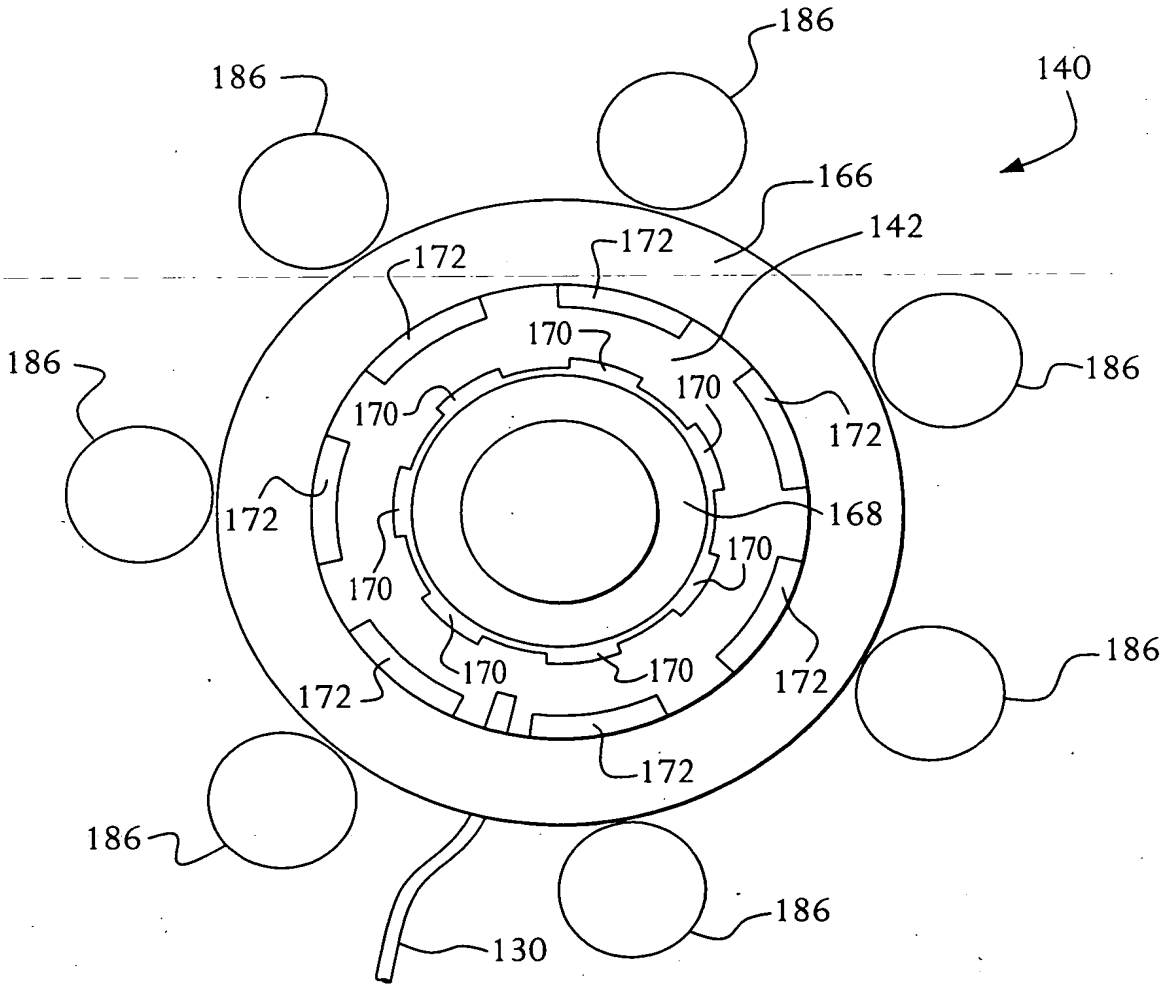
186
186
140
166
142
172
172
170
186
170
170
172
172
168
170
170
186
172
170
170
172
172
186
186
130
186

FIG. 7

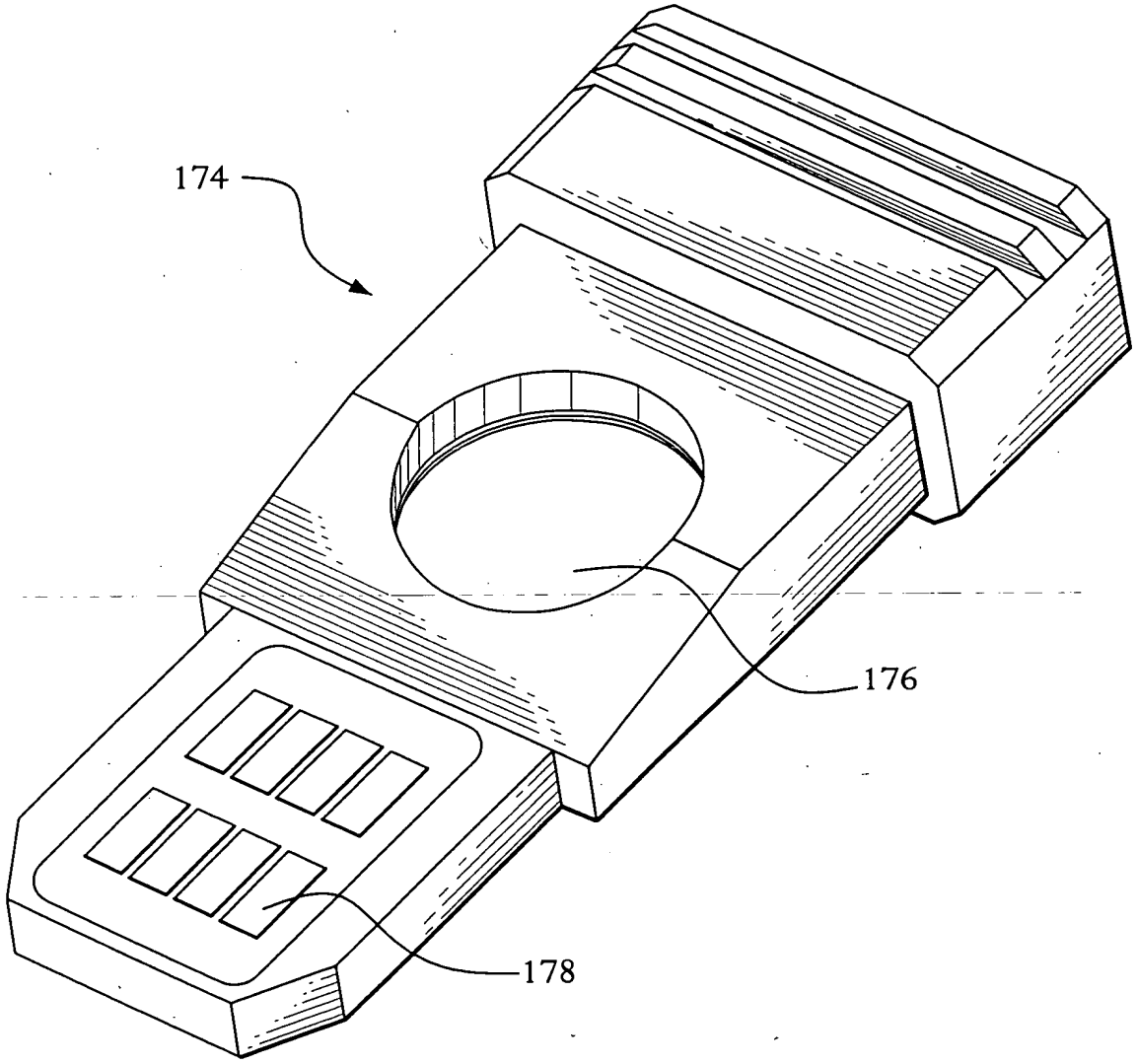

FIG. 8

PCT/US03/04050

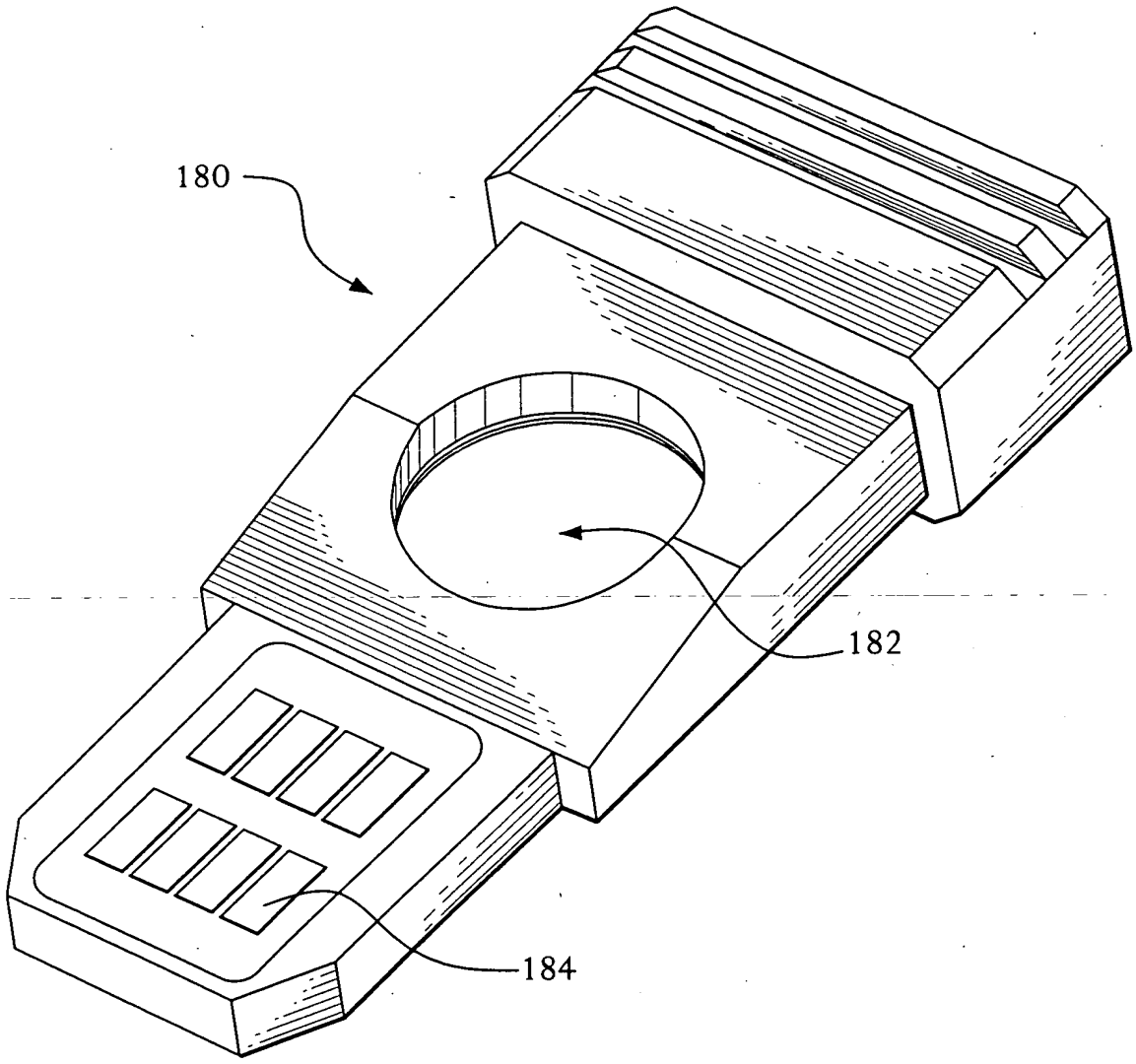

FIG. 9

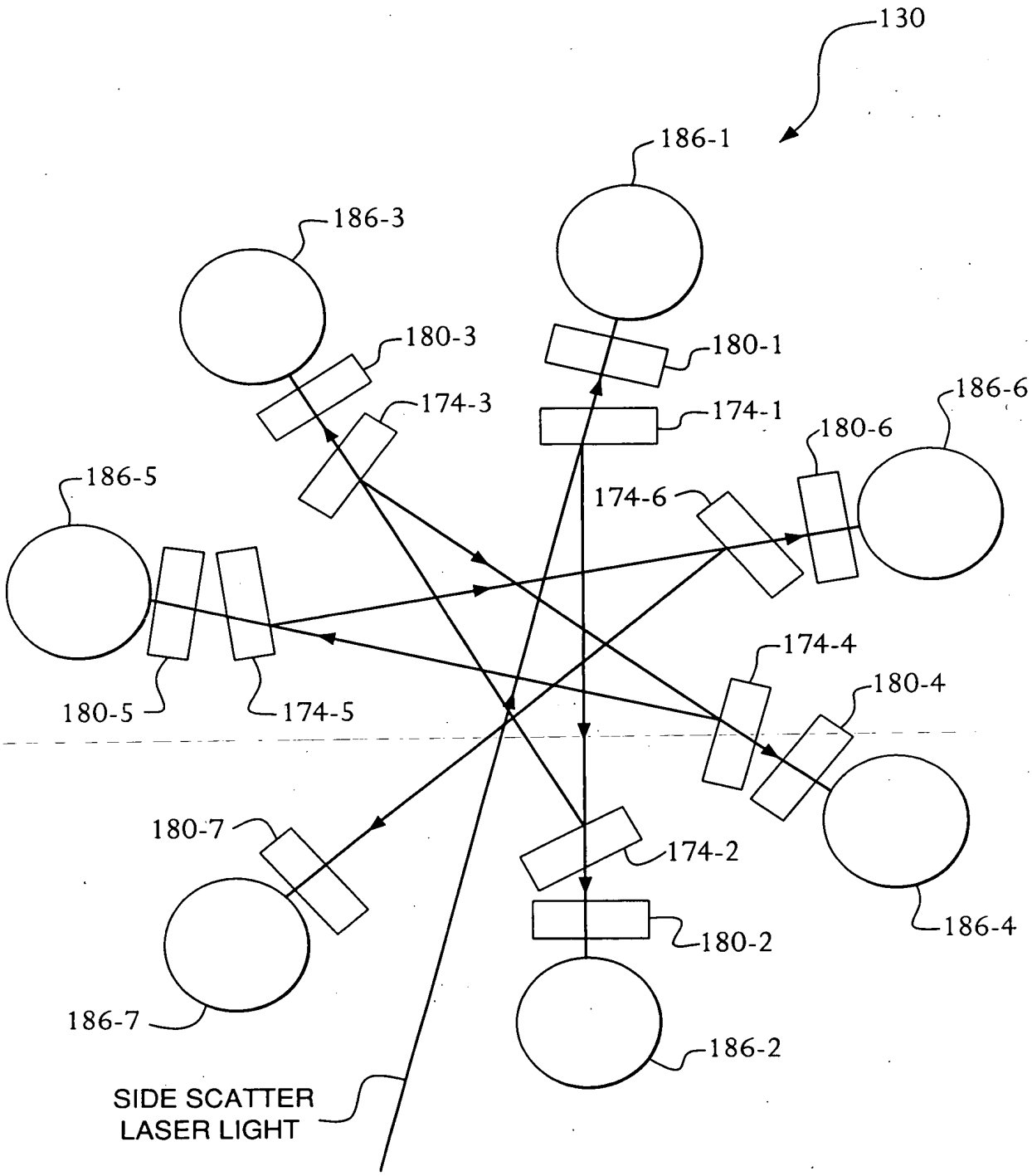
130
186-1
186-3
180-3
180-1
174-3
174-1
186-6
180-6
186-5
174-6
174-4
180-4
180-5
174-5
180-7
174-2
180-2
186-4
186-7
186-2
SIDE SCATTER
LASER LIGHT

FIG. 10

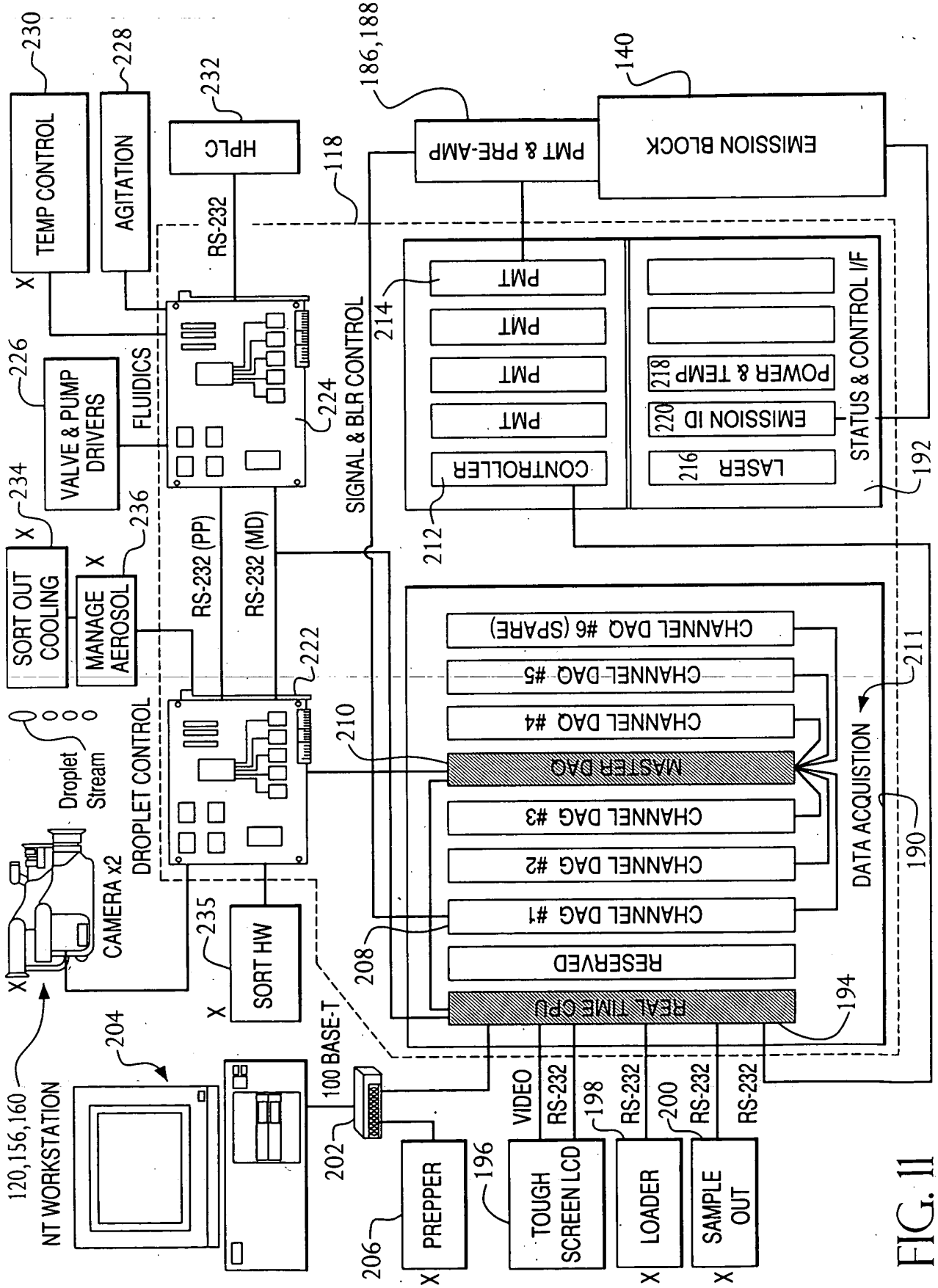
TEMP CONTROL
AGITATION
HPLC
PMT & PRE-AMP
EMISSION BLOCK
RS-232
SIGNAL & BLR CONTROL
PMT
PMT
PMT
PMT
CONTROLLER
LASER
EMISSION ID
POWER & TEMP
STATUS & CONTROL I/F
VALVE & PUMP DRIVERS
FLUIDICS
SORT OUT COOLING
MANAGE AEROSOL
RS-232 (PP)
RS-232 (MD)
CHANNEL DAQ #6 (SPARE)
CHANNEL DAQ #5
CHANNEL DAQ #4
MASTER DAQ
CHANNEL DAQ #3
CHANNEL DAQ #2
CHANNEL DAQ #1
RESERVED
REAL TIME CPU
DATA ACQUISITION
DROPLET CONTROL
Droplet Stream
CAMERA x2
SORT HW
100 BASE-T
VIDEO
RS-232
RS-232
RS-232
RS-232
NT WORKSTATION
PREPPER
TOUGH SCREEN LCD
LOADER
SAMPLE OUT
230
228
232
186,188
140
118
214
226
224
234
236
222
210
211
212
192
218
220
216
208
190
194
204
120,156,160
235
202
196
198
200
206

FIG. 11

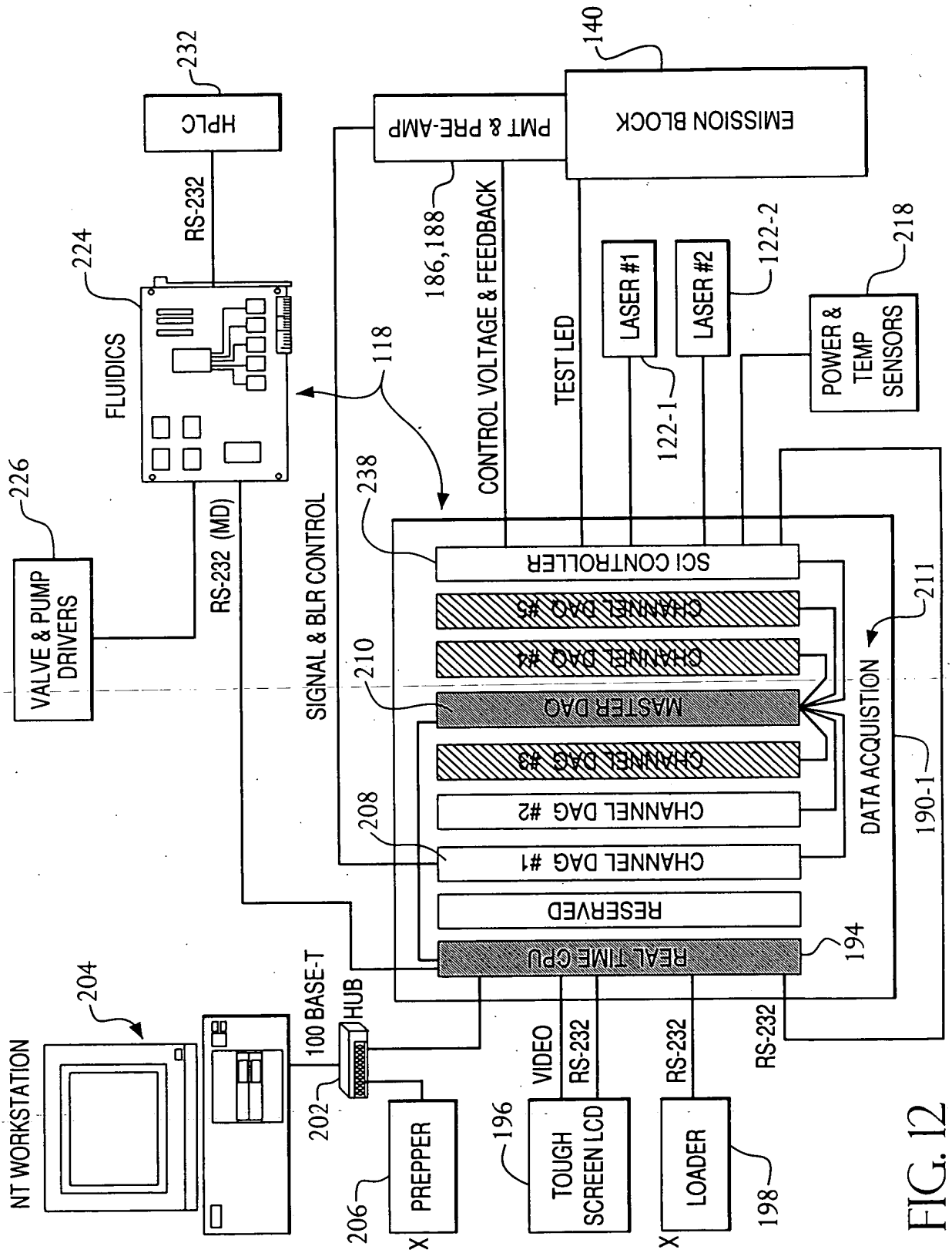
232
HPLC
RS-232
224
FLUIDICS
226
VALVE & PUMP DRIVERS
RS-232 (MD)
SIGNAL & BLR CONTROL
238
118
140
PMT & PRE-AMP
EMISSION BLOCK
186,188
CONTROL VOLTAGE & FEEDBACK
TEST LED
LASER #1
LASER #2
122-1
122-2
POWER & TEMP SENSORS
218
SCI CONTROLLER
CHANNEL DAQ #5
CHANNEL DAQ #4
MASTER DAQ
CHANNEL DAQ #3
CHANNEL DAQ #2
CHANNEL DAQ #1
RESERVED
REAL TIME CPU
210
208
211
DATA ACQUISTION
190-1
194
204
NT WORKSTATION
100 BASE-T
HUB
202
206
PREPPER
VIDEO
RS-232
196
TOUGH SCREEN LCD
RS-232
198
LOADER
RS-232

FIG. 12

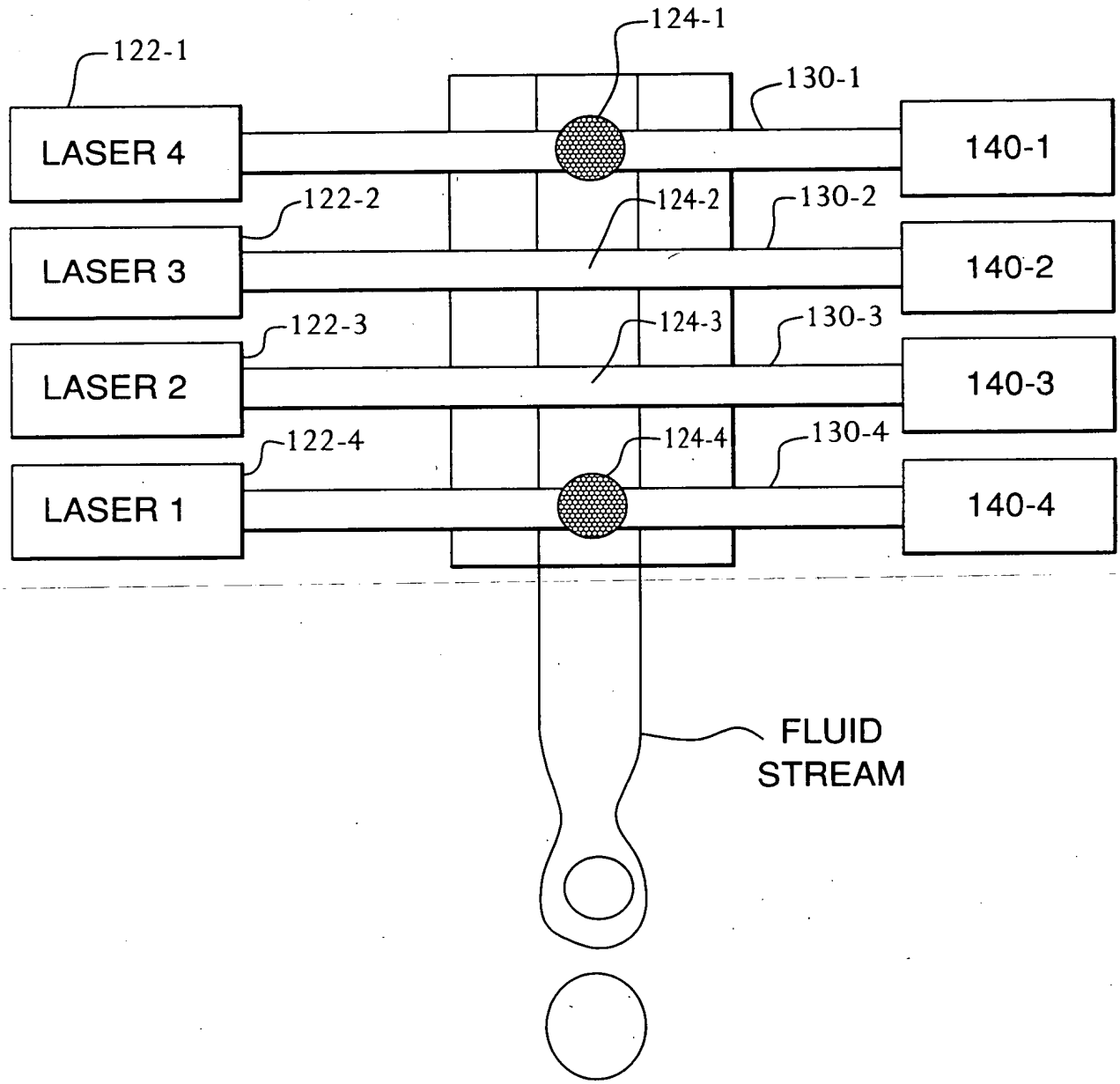
122-1
124-1
130-1
LASER 4
140-1
122-2
124-2
130-2
LASER 3
140-2
122-3
124-3
130-3
LASER 2
140-3
122-4
124-4
130-4
LASER 1
140-4
FLUID
STREAM

FIG. 13

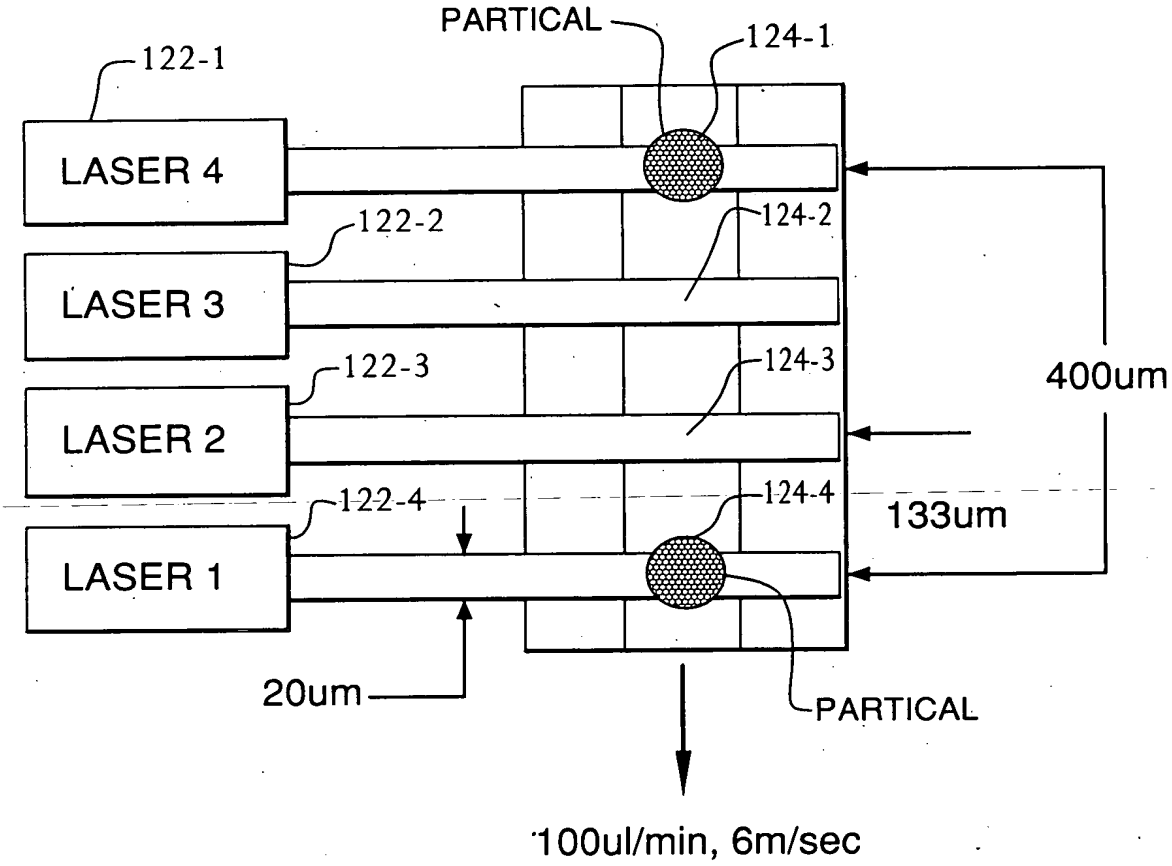
PARTICAL
124-1
122-1
LASER 4
122-2
124-2
LASER 3
122-3
124-3
LASER 2
400um
122-4
124-4
133um
LASER 1
20um
PARTICAL
100ul/min, 6m/sec

FIG. 14

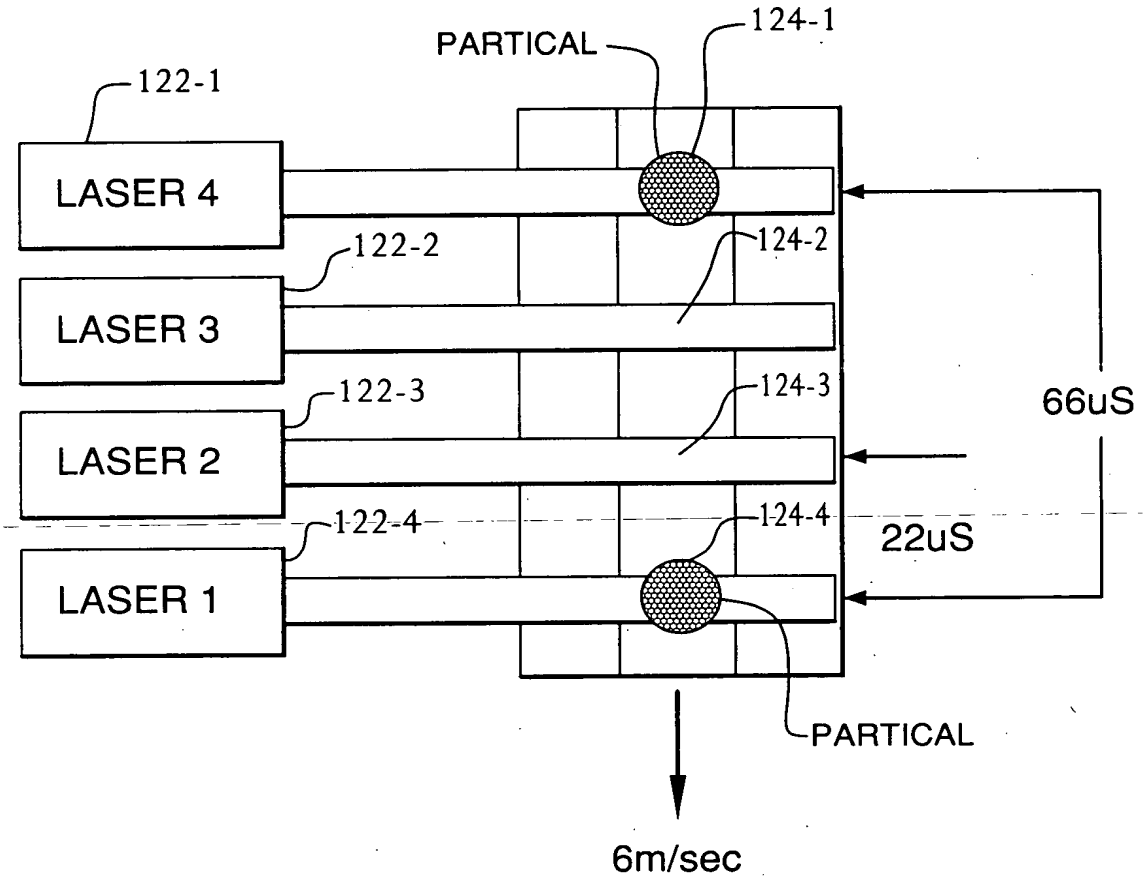
PARTICAL
124-1
122-1
LASER 4
122-2
124-2
LASER 3
122-3
124-3
LASER 2
122-4
124-4
LASER 1
66uS
22uS
PARTICAL
6m/sec

FIG. 15

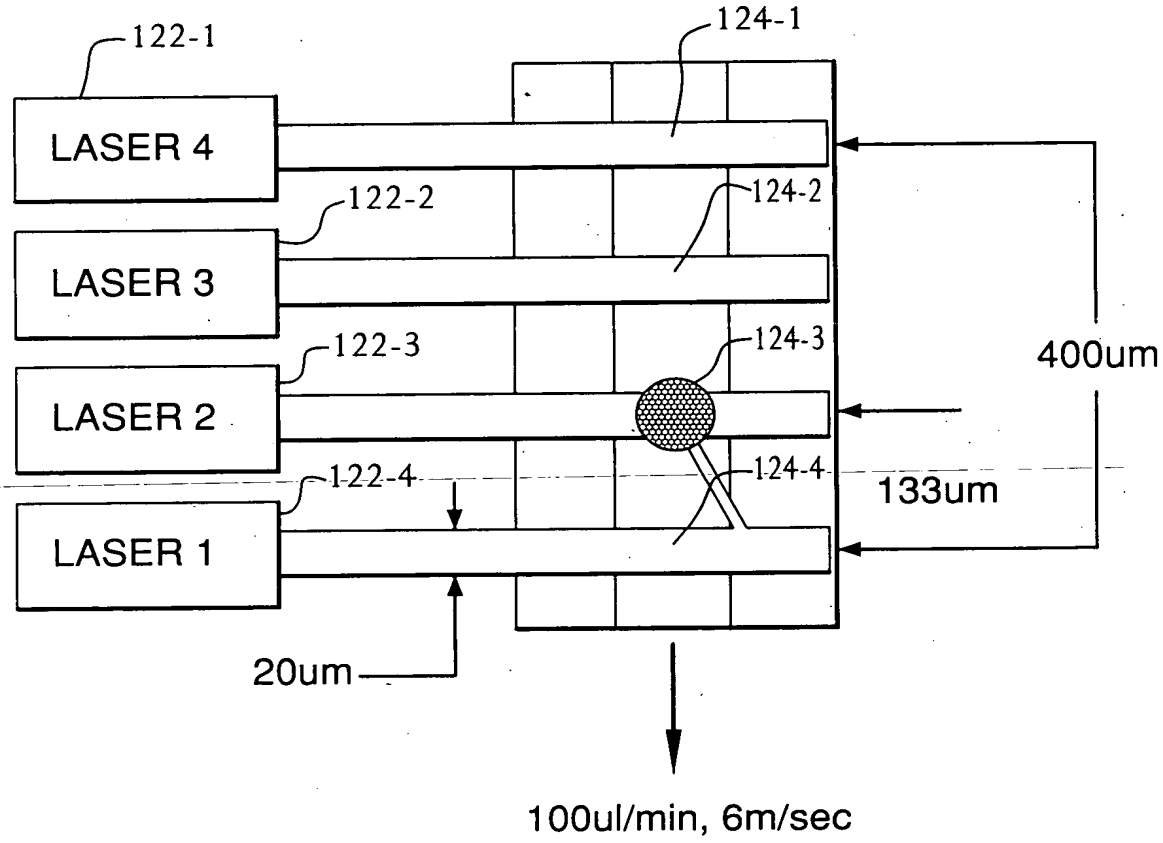
122-1
124-1
LASER 4
122-2
124-2
LASER 3
122-3
124-3
LASER 2
122-4
124-4
LASER 1
400um
133um
20um
100ul/min, 6m/sec

FIG. 16

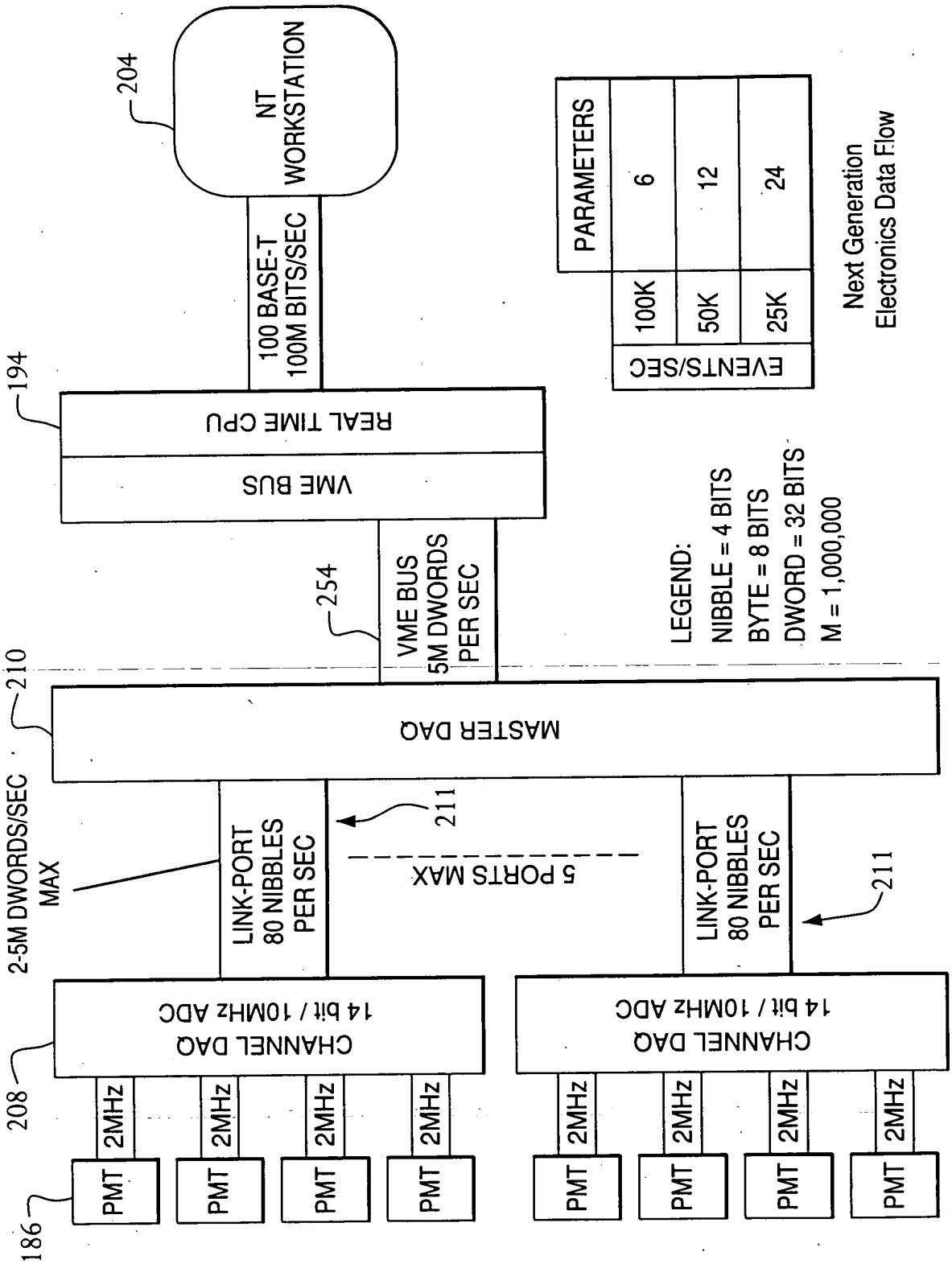
Next Generation
Electronics Data Flow
PARAMETERS
6
12
24
EVENTS/SEC
100K
50K
25K
LEGEND:
NIBBLE = 4 BITS
BYTE = 8 BITS
DWORD = 32 BITS
M = 1,000,000
204
NT
WORKSTATION
100 BASE-T
100M BITS/SEC
194
REAL TIME CPU
VME BUS
254
VME BUS
5M DWORDS
PER SEC
210
MASTER DAQ
2-5M DWORDS/SEC
MAX
LINK-PORT
80 NIBBLES
PER SEC
211
5 PORTS MAX
211
LINK-PORT
80 NIBBLES
PER SEC
208
CHANNEL DAQ
14 bit / 10MHz ADC
CHANNEL DAQ
14 bit / 10MHz ADC
2MHz
2MHz
2MHz
2MHz
2MHz
2MHz
2MHz
2MHz
186
PMT
PMT
PMT
PMT
PMT
PMT
PMT
PMT

FIG. 17

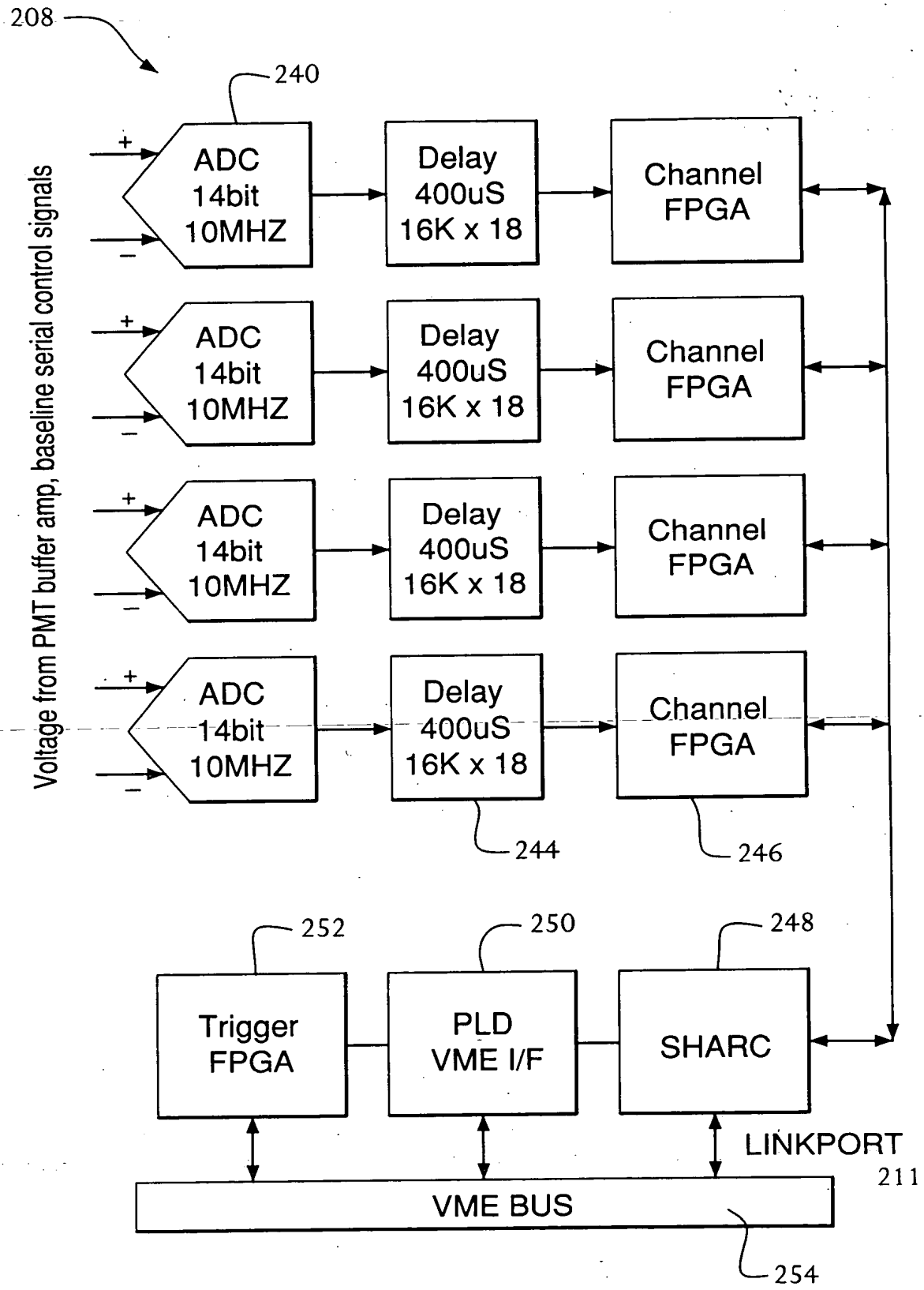
208
240
Voltage from PMT buffer amp, baseline serial control signals
ADC
14bit
10MHZ
Delay
400uS
16K x 18
Channel
FPGA
244
246
252
250
248
Trigger
FPGA
PLD
VME I/F
SHARC
LINKPORT
211
VME BUS
254

FIG. 18

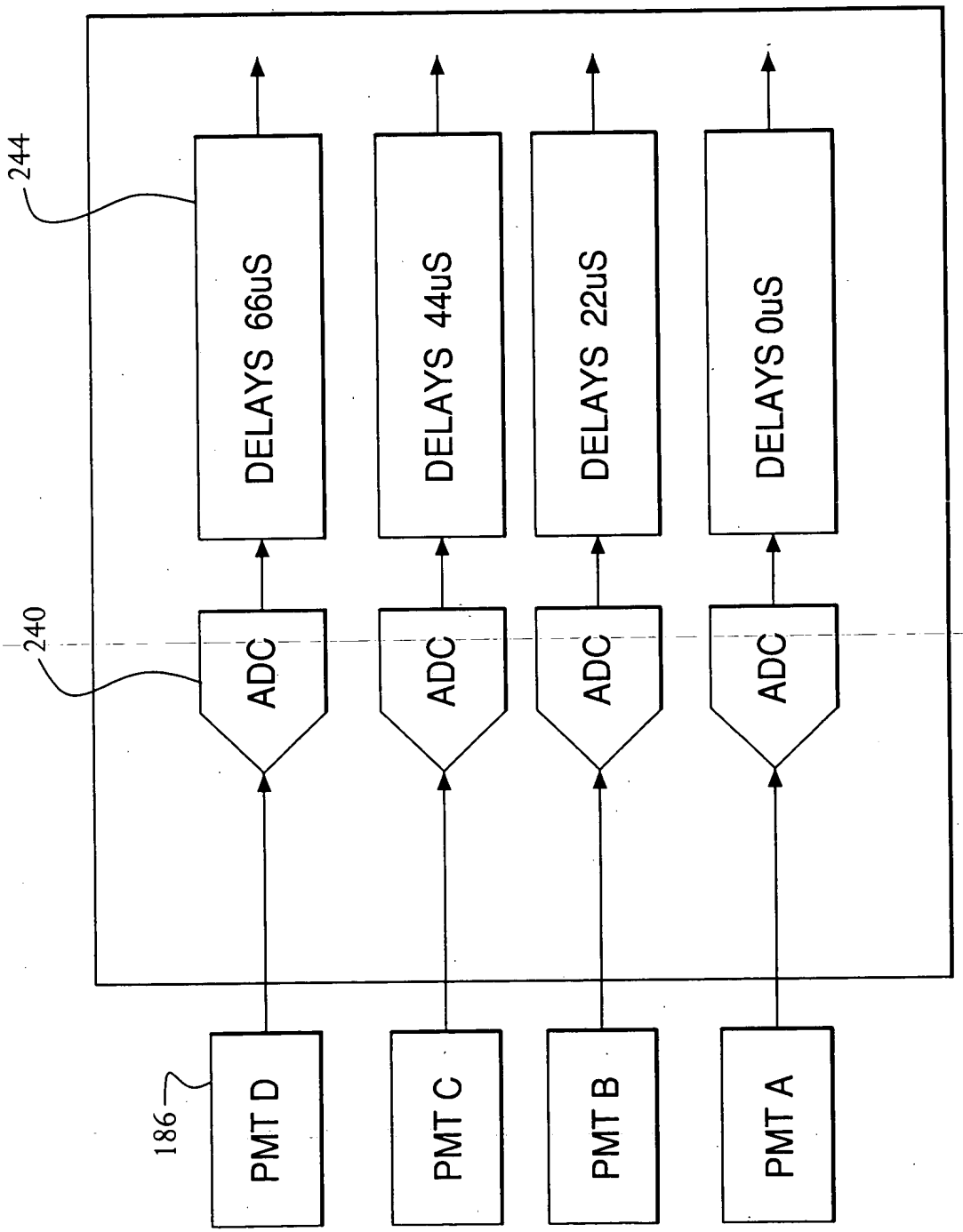
244
240
186
DELAYS 66uS
DELAYS 44uS
DELAYS 22uS
DELAYS 0uS
ADC
ADC
ADC
ADC
PMT D
PMT C
PMT B
PMT A

FIG. 19

TOSOOT "ehOE5860

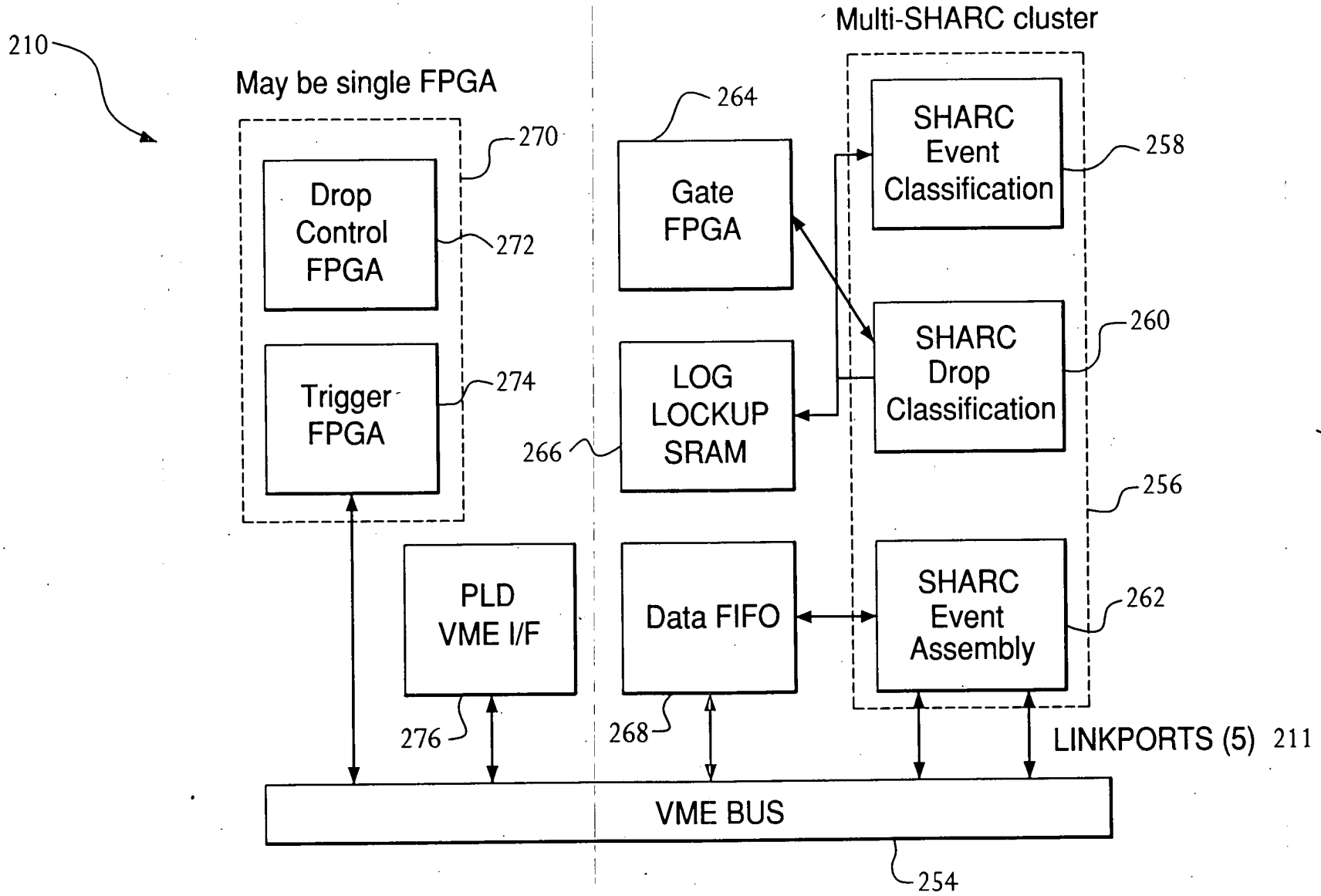

FIG. 20

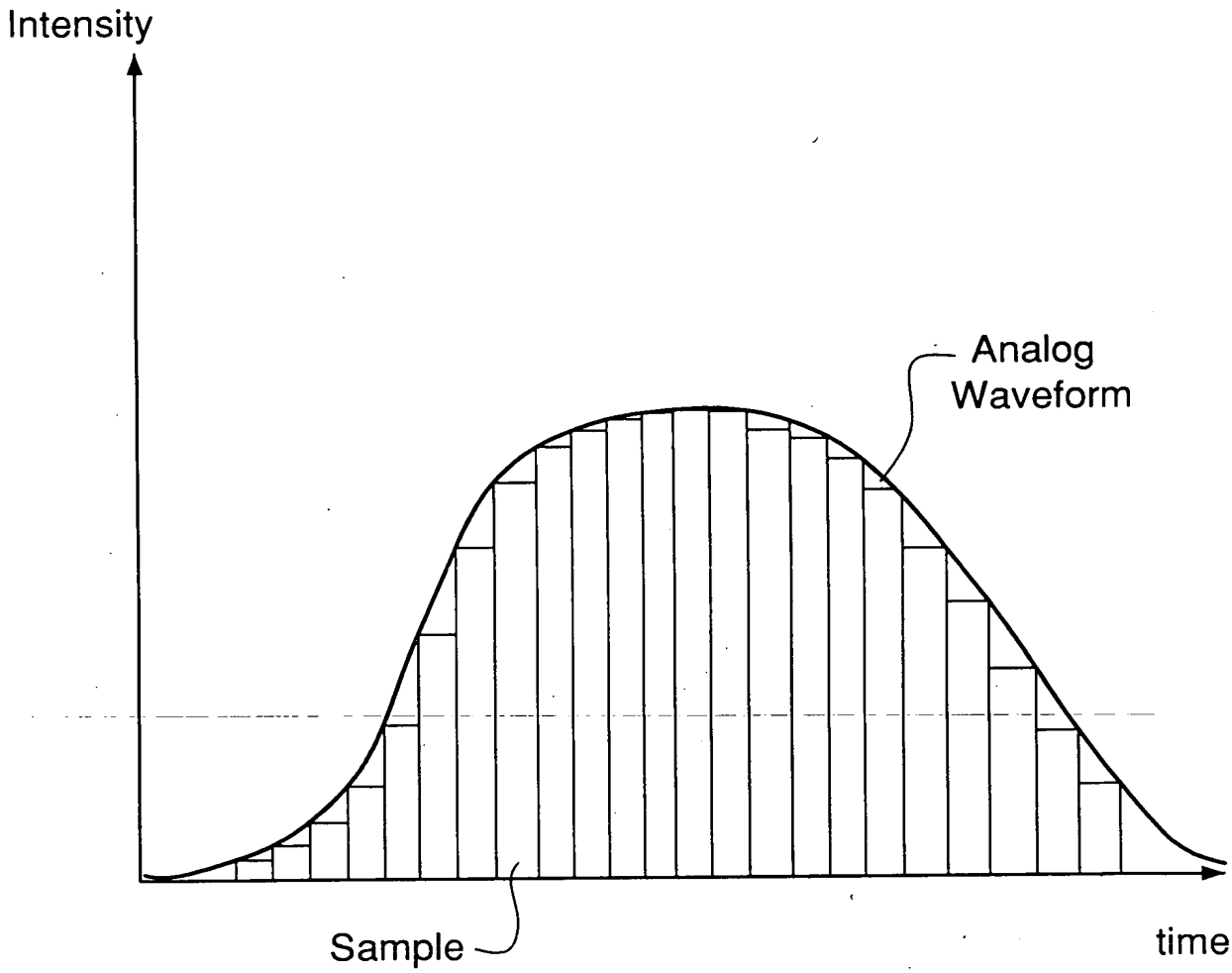

FIG. 21

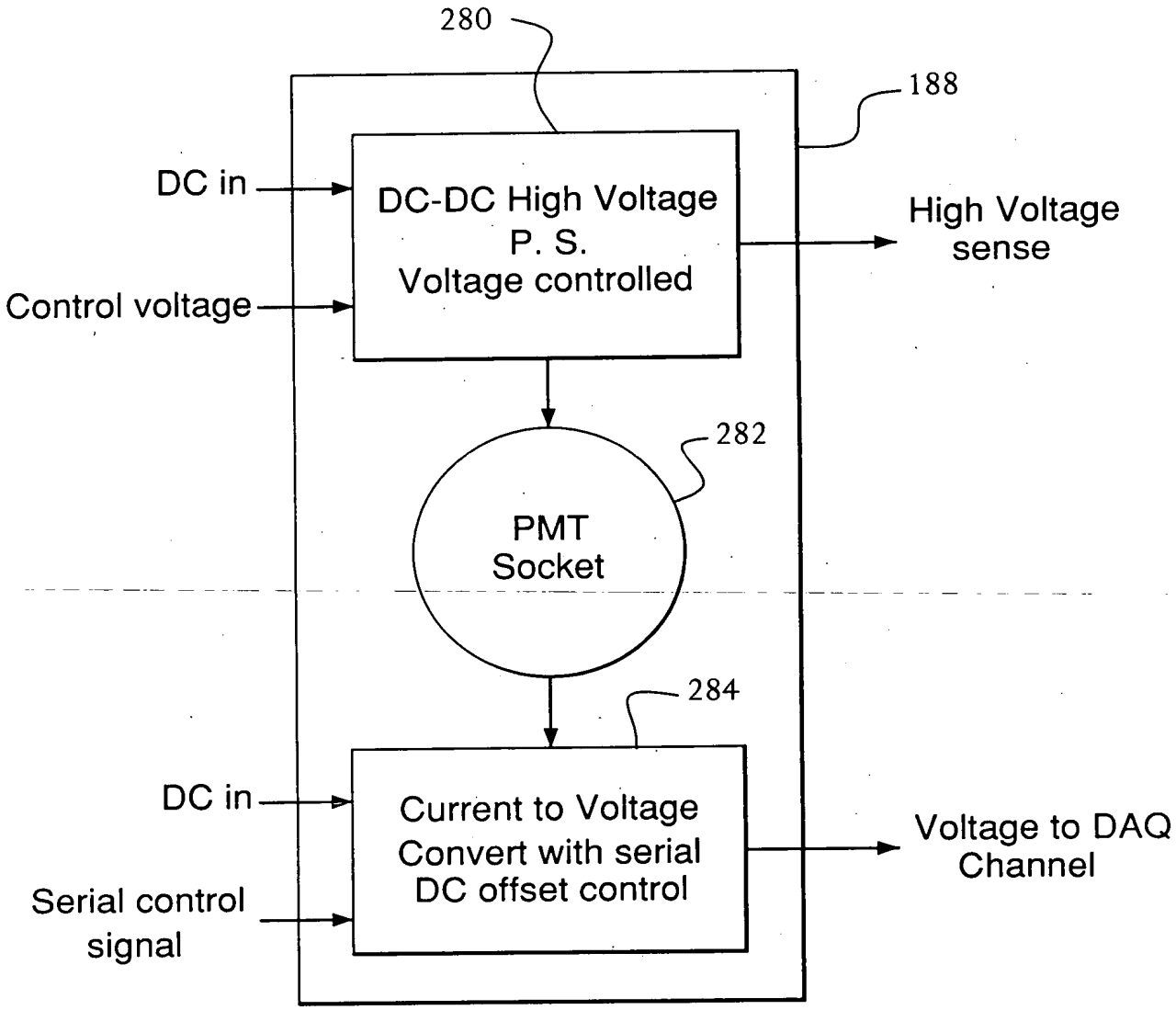
280
188
DC in
DC-DC High Voltage
P. S.
Voltage controlled
High Voltage
sense
Control voltage
282
PMT
Socket
284
DC in
Current to Voltage
Convert with serial
DC offset control
Voltage to DAQ
Channel
Serial control
signal

FIG. 22

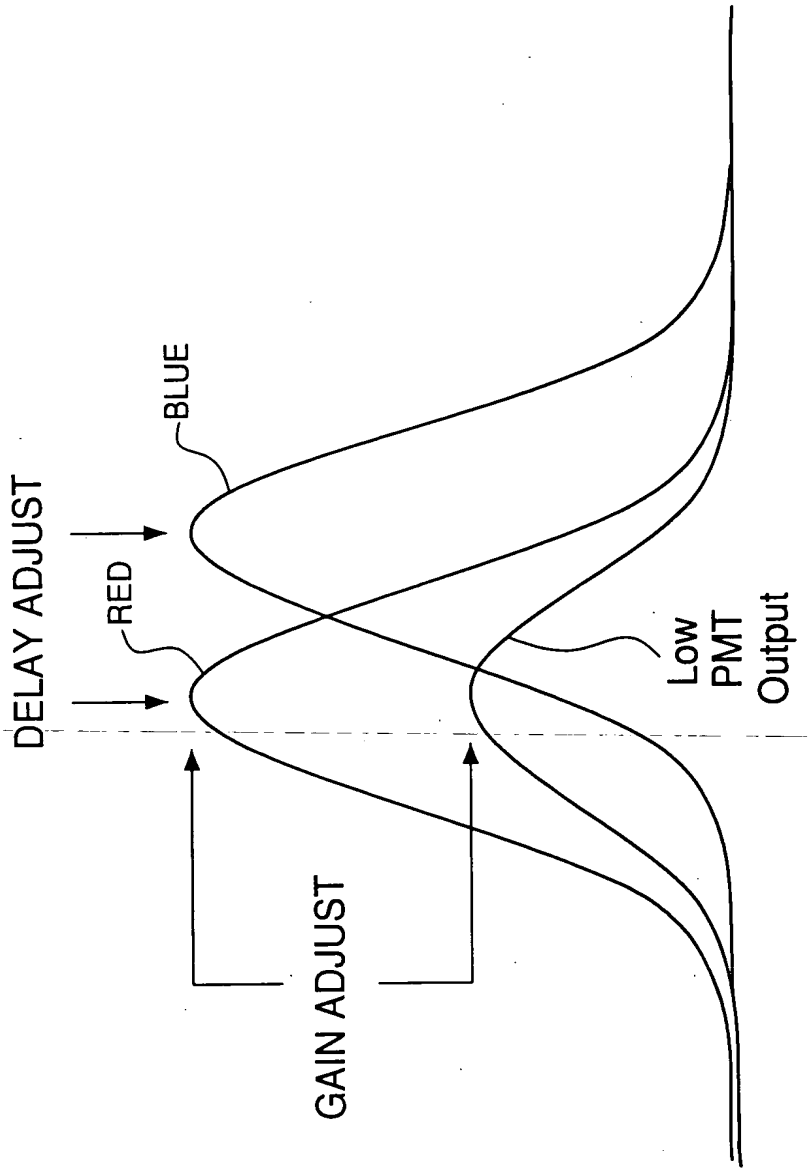
DELAY ADJUST
RED
BLUE
GAIN ADJUST
Low
PMT
Output
Raw Channel Signal

FIG. 23

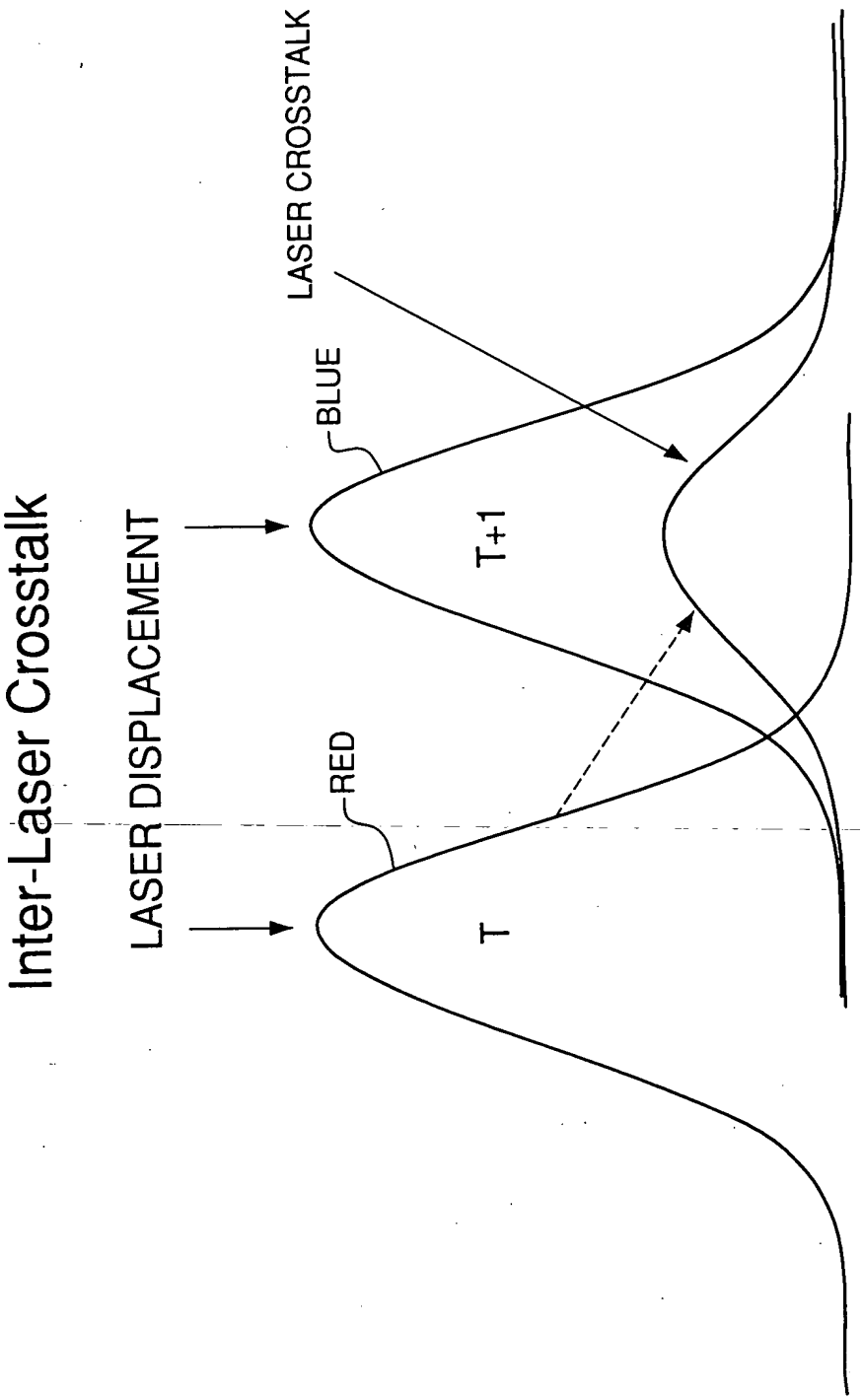
Inter-Laser Crosstalk
LASER DISPLACEMENT
RED
BLUE
LASER CROSSTALK
T
T+1
TIME

FIG. 24

TOSOOT "EHDE5860

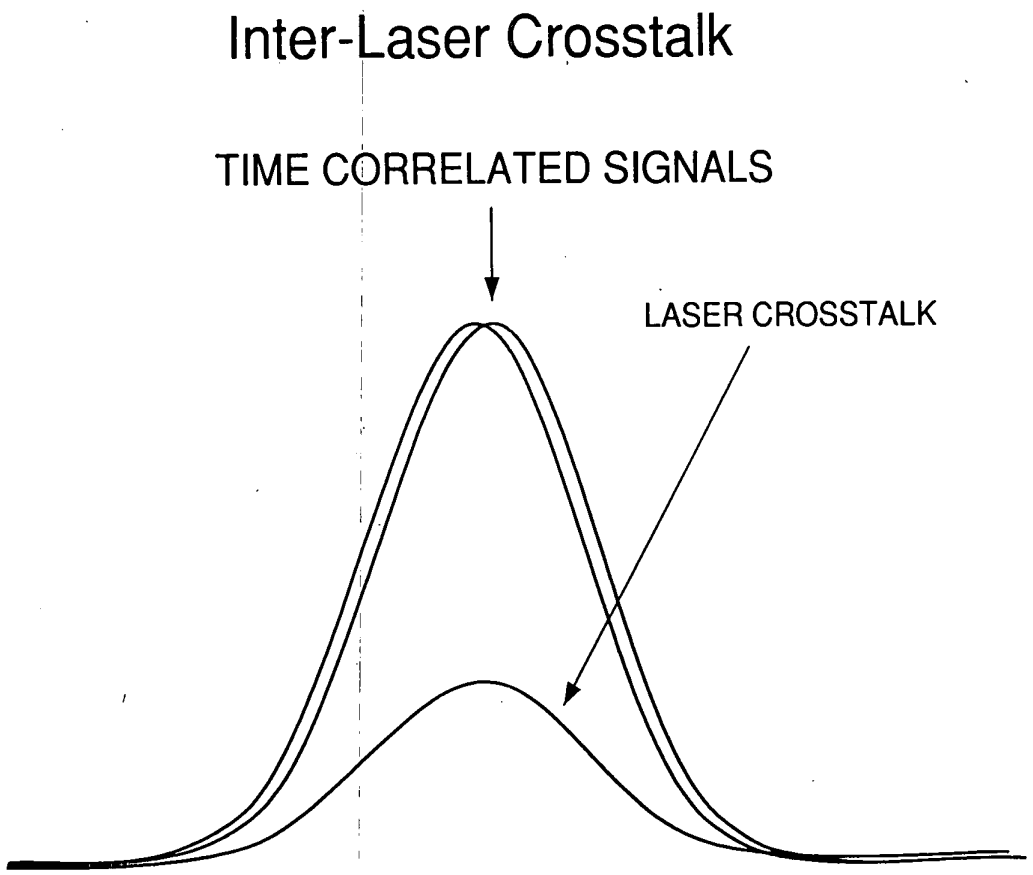

FIG. 25

TOSOT EP02586

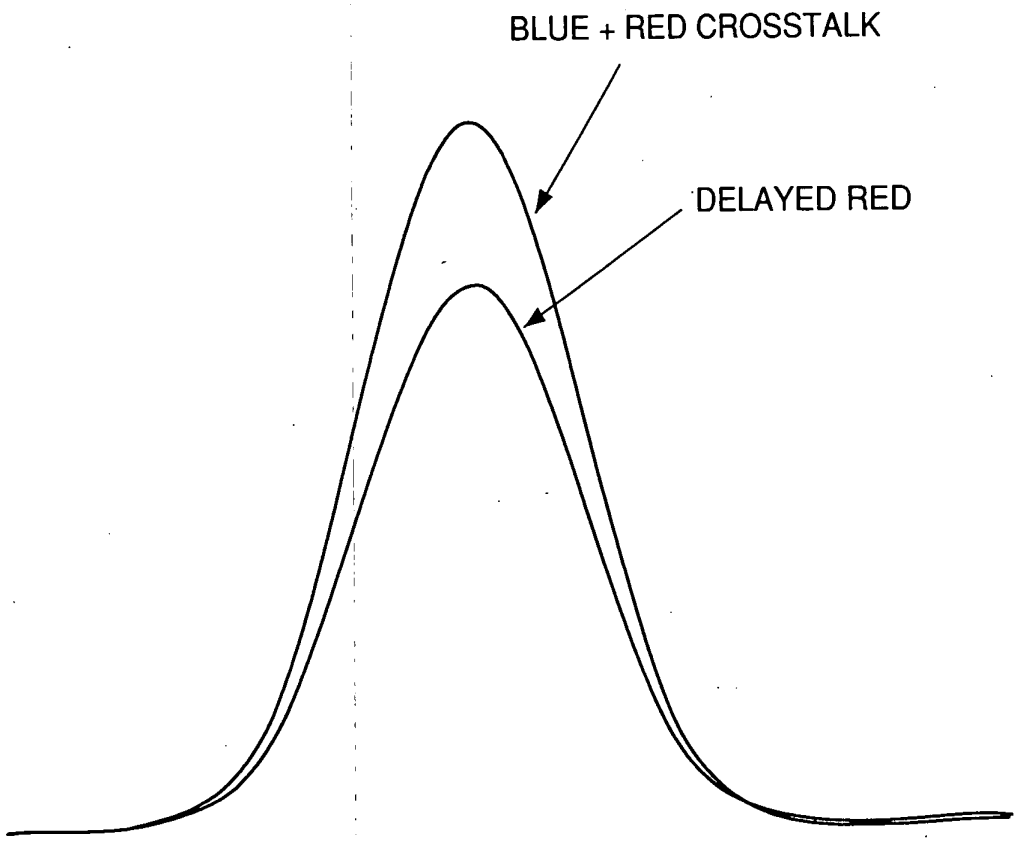

FIG. 26

TOSOT EAGE860

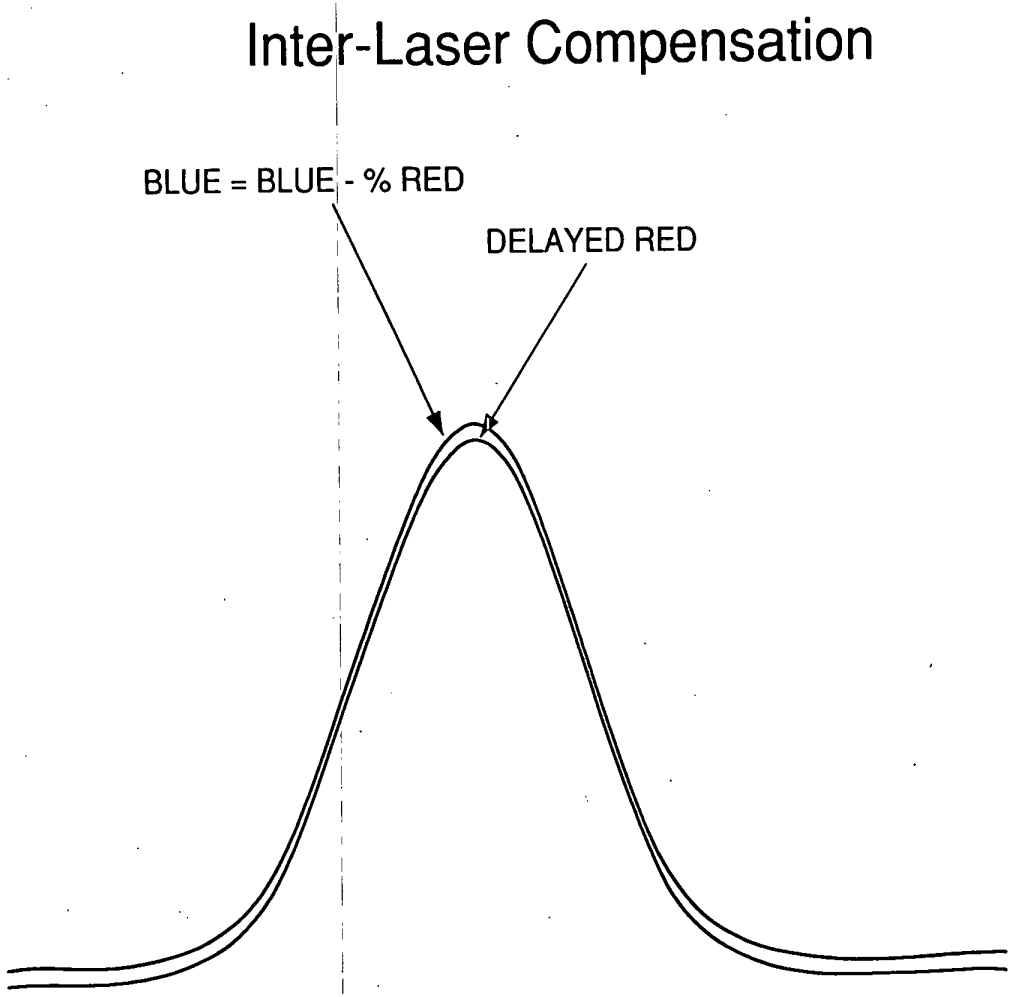

FIG. 27